



Amended CLAIMS,

as submitted by way of preliminary amendment of July 2002

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*#5/Pre Amdt. A*  
*8-13-02*

Claims deleted: claim 1, as filed

New Claims now added: 2-13

- Sub B1*  
*CI*  
*AT*
- CLAIM 2.** Procedure for attaching a headrest-tube to an elongate seatframe-piece of an automobile seat having an upper side and a lower side, including:
- [02] providing a through-hole in the seatframe-piece, through from the upper side to the lower side, for receiving the headrest-tube;
  - [03] making a sub-assembly of the headrest-tube in the through-hole, wherein the headrest tube has an upper portion, which lies above the seatframe-piece, and a lower portion, which lies below the seatframe-piece;
  - [04] providing a die-set, which includes an upper punch and a lower punch, and arranging the sub-assembly in the die-set, with the headrest-tube vertical;
  - [05] providing the headrest-tube with an upper shoulder, which lies in contact with the upper side of the seatframe-piece over an upper annular margin of that upper side, being a margin surrounding the through-hole;
  - [06] pressing the headrest-tube vertically, in the die-set, with a lower-tube-collapsing-force;
  - [07] applying the lower-tube-collapsing-force in such manner as to collapse the lower-portion of the headrest tube, and thereby to expand the lower-portion diametrically, at least over a region of the lower-portion of the headrest-tube adjacent to the lower side of the seatframe-piece, thereby forming a lower-shoulder of the headrest-tube;
  - [08] wherein the lower-shoulder lies in contact with the lower side of the seatframe-piece, over a lower annular margin of the lower side of the seatframe-piece, surrounding the through-hole;
  - [09] pressing the headrest-tube vertically with a tube-coining-force;
  - [10] applying the tube-coining-force between the upper and lower shoulders;
  - [11] wherein the tube-coining-force is of sufficient magnitude to coin the upper and lower shoulders together, onto the two sides of the seatframe-piece, whereby the seatframe-piece becomes gripped between the upper and lower shoulders of the headrest-tube;
  - [12] wherein the tube-coining-force is much larger than the tube-collapsing-force;
  - [13] taking the sub-assembly out of the die-set.

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**Claim 3.** Procedure of claim 2, including providing the upper shoulder as an upper ring-bead.

**Claim 4.** Procedure of claim 3, wherein the upper ring-bead was pre-formed on the headrest-tube, prior to the headrest tube being inserted into the through-hole.

**Claim 5.** Procedure of claim 3, including:

- [02] providing the lower-shoulder as a lower ring-bead;
- [03] forming the upper ring-bead in the headrest-tube after the headrest tube has been inserted into the through-hole, and before forming the lower ring-bead in the headrest-tube.

**Claim 6.** Procedure of claim 5, including:

- [02] providing an annular nose on the lower-punch, to confine the lower-portion of the headrest tube against diametral expansion;
- [03] positioning the annular nose against the lower annular margin of the seatframe-piece while pressing the upper portion of the headrest-tube with an upper-tube-collapsing-force.

**Claim 7.** Procedure of claim 2, including:

- [02] the headrest-tube having a lower end-abutment, which is spaced vertically along the headrest-tube away from the <sup>up</sup>second shoulder; <sup>upper</sup>
- [03] arranging the upper punch and lower punch to apply the lower-tube-collapsing-force to the headrest-tube between the lower end-abutment and the upper-shoulder;
- [04] arranging the upper punch and lower punch to apply the tube-coining-force to the headrest tube between the upper-shoulder and the lower-shoulder.

**Claim 8.** Procedure of claim 2, including forming the upper and lower shoulders as upper and lower ring-beads, after the headrest-tube has been inserted into the through-hole, in the following sequence:

- [02] providing the lower punch with a lower-annular-nose, which confines a lower-portion of the headrest tube against diametral expansion;
- [03] arranging the die-set so the nose contacts against the lower-annular-margin;
- [04] applying an upper-tube-collapsing-force between an upper-end-abutment of the headrest-tube and the lower-annular-nose, whereby the upper-portion of the headrest-tube collapses vertically and expands diametrically, and forms the upper ring-bead;
- [05] then withdrawing the lower-annular-nose, whereby now the lower-portion of the headrest tube can expand;

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- [06] then applying the lower-tube-collapsing-force between the lower end-abutment and the just-formed upper ring-bead, whereby the lower portion collapses and expands, and forms the lower ring-bead;
- [07] then arranging the die-set to apply the tube-coining-force, between the upper and lower ring-beads.

**Claim 9.** Procedure of claim 8, including so arranging the die-set that the upper and lower punches do not touch directly against the seatframe-piece, when applying the upper-tube-collapsing-force, nor when applying the tube-coining-force.

**Claim 10.** Procedure of claim 2, including:

- [02] providing the upper shoulder as an upper ring-bead, and the lower-shoulder as a lower ring-bead;
- [03] so arranging the die set as to form the upper and lower shoulders simultaneously.

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**Claim 11.** Procedure of claim 2, wherein:

- [02] the seatframe-piece is in the form of a flanged section, having a web, and having a flange alongside, and contiguous with, the web;
- [03] the said through-hole comprises a hole through the web;
- [04] the flanged form is characterised in that the flange protrudes with respect to the web in the vertical direction, on at least one of the sides of the seatframe-piece;
- [05] the seatframe-piece has the flanged section over at least a flange-portion of the seatframe-piece, being a portion that includes the annular margin.

**Claim 12.** Procedure of claim 2, wherein:

- [02] the seatframe-piece is in the form of an I-beam section, having a web, and having flanges to left and right of, and contiguous with, the web;
- [03] the said through-hole comprises a hole through the web;
- [04] the I-beam form is characterised in that the left and right flanges protrude with respect to the web in the vertical direction, on both the upper side and lower side of the seatframe-piece;
- [05] the seatframe-piece has the I-beam section over at least a portion of the seatframe piece that includes the annular margin.

**Claim 13.** Procedure of claim 2, wherein the seatframe piece comprises two metal tubes, one inside the other.

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